



Curtin

University of Technology
Western Australia
National Drug Research Institute

ALCOHOL STUDIES Bulletin

a joint project funded by the Drug Programs Bureau, NSW Health



NSW Bureau of Crime
Statistics and Research

This bulletin is the first in a series of publications reporting on alcohol and crime produced by the NSW Bureau of Crime Statistics and Research and the National Drug Research Institute of Curtin University.

**Number 1
May 2001**

Temporal and Regional Aspects of Alcohol-Related Violence and Disorder

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The purpose of this bulletin is to review research exploring the relationship between alcohol and crime, and to examine patterns of alcohol-related crime arising from New South Wales police records. The number of assault, offensive behaviour and malicious damage to property incidents flagged by police as being alcohol-related are included in this analysis. Characteristics of alcohol-related crime, such as where and when it is most likely to occur, as well as the gender and age of persons typically involved, are also reported. Strategies to reduce alcohol-related crime and important areas for future research arising from these findings are discussed.

In recent times, much media attention has been focused on crime associated with illicit drug use and consequently, resources have often been devoted to identifying and targeting the associated problems. However, in the United States, it has been found that more crime is committed under the influence of alcohol than under the influence of all illegal drugs combined (United States Department of Justice 1998). Several Australian studies have also established that alcohol is significantly associated with crime, especially violent crime, and have been able to identify a number of areas that could be targeted in an attempt to reduce alcohol-related crime (e.g. Devery 1992; Ireland & Thommeny 1993; Stevenson, Lind & Weatherburn 1999).

The association between crime and the consumption of alcohol is not a new discovery and a myriad of research studies attempting to examine the nature of this relationship have evolved over time. These studies are typically grouped into three main categories: studies examining the drinking habits of convicted offenders, studies examining alcohol consumption around the time of arrest and geographical studies examining the relationship between variations in the crime rate in different

areas and variations in alcohol consumption (Burns, Flaherty, Ireland & Frances 1995; Stevenson 1996). This bulletin reviews several of these types of alcohol and crime studies and elaborates further on this relationship by exploring current patterns arising from New South Wales (NSW) police records of alcohol-related crime.

SCALE OF THE PROBLEM IN AUSTRALIA

The 1998 National Drug Strategy Household survey (NDSH) reveals that just over 80 per cent of Australians aged 14 years or over report that they consume alcohol (Australian Institute of Health and Welfare 1999). While a large majority of these persons would be regarded as responsible drinkers, the NDSH indicates that a significant minority is involved in alcohol-related crime. Results showed that almost 10 per cent of persons aged 14 years or over reported verbally abusing someone while under the influence of alcohol and a further 2 per cent reported physically abusing someone while under the influence of alcohol.

Since this survey relies on self-report data these figures are likely to

underestimate the actual proportion of alcohol-related incidents in Australia. Indeed, the extent of alcohol-related crime becomes more apparent when considering the number of victims reporting such crime. The NDSH found that in the 12 months preceding the 1998 survey, 29 per cent of persons aged 14 years or older were victims of alcohol-related verbal abuse, 16 per cent were put in fear by someone affected by alcohol and just over 6 per cent reported being physically abused by someone affected by alcohol. Translating these figures into actual numbers of victims in Australia, the NDSH estimated that 4.4 million persons were victims of alcohol-related verbal abuse, 2.4 million persons were put in fear by alcohol-affected persons and 900,000 persons were victims of alcohol-related physical assaults. Furthermore, it was found that Australians were more than twice as likely to be victims of alcohol-related incidents than to be victims of incidents related to other drugs.

More recently, a secondary analysis of the data collected in the 1998 NDSH examined the socio-demographic risk factors for being a victim of alcohol-related violence. In this research, Teece and Williams (2000) found that being

young and being male were the most significant predictors of alcohol-related victimisation, even after controlling for variables such as patterns of drinking, socialising and absence from home. The incidence of alcohol-related assaults was also found to be concentrated at certain times and places, with most victims experiencing alcohol-related violence at night, on weekends and at pubs/clubs or on the street. While many of the offenders were known to their victim, 56 per cent of assault victims were unable to identify the perpetrator(s) involved in the violent incident.

Other research conducted by Chikritzhs, Jonas, Heale, Dietze, Hanlin and Stockwell (1999) has attempted to estimate the total number of assault hospitalisations and deaths caused by hazardous and harmful alcohol consumption in Australia. Using the numbers of hospitalisations/deaths adjusted by year specific 'aetiologic fractions' they estimated that, in 1997, 6,505 males and 2,049 females had to be hospitalised for an alcohol-related assault. Also in 1997, 84 males and 40 females were estimated to have died as a result of an assault attributable to high-risk drinking.

RELATIONSHIP BETWEEN ALCOHOL AND CRIME

One of the typical methods used to investigate the relationship between alcohol and crime is examination of offenders' drinking habits prior to committing an offence. In NSW, one such study found that over one-third of convicted adult criminals reported drinking alcohol prior to committing their most serious offence. Furthermore, the majority of offenders convicted of assault admitted that they were under the influence of alcohol at the time of their offence (Kevin 1992). In a Western Australian prison sample, 34 per cent of offenders had been drinking alcohol before committing their last offence and one-third of this group had committed offences against the person (Indermaur 1990).

The involvement of alcohol in violent incidents is also evident from the reports of domestic violence victims. In a survey of persons who had been granted

Apprehended Violence Orders by Local Courts in Sydney, one-quarter of participants perceived alcohol to be one of the triggers for the defendant's negative behaviour toward them. In approximately one-third of physical assaults or threatened physical assaults reported by these participants, the defendant had been drinking at the time the incident occurred (Trimboli & Bonney 1997).

Other studies have used recorded crime to examine the relationship between alcohol and crime. Ireland and Thommeny (1993) had police officers from six different Sydney police patrols record their assessment of alcohol involvement for all incidents attended over a four-week period and estimated that 77 per cent of street incidents (assault, offensive behaviour, offensive language, malicious damage, domestic violence, noise complaint and drink driving) involved alcohol. Furthermore, a large proportion of these offences occurred either in or near hotels and 91 per cent of all alcohol-related incidents occurred during the hours of 10.00 pm and 2.00 am. Similarly, Devery (1992), in an investigation of when and where crime occurred in the Local Government Area of Waverley in Sydney, found not only that most assaults took place where the majority of clubs, hotels and restaurants were located, but also that they usually occurred in conjunction with hotel and club closing times (i.e. between 9.00 pm and 3.00 am). These findings become more significant when one considers that only a small proportion of violent incidents on licensed premises are reported to police (Homel, Tomsen & Thommeny 1991).

Research from Western Australia has attempted to identify particular characteristics of licensed premises that may increase the risk of alcohol-related harm. Stockwell, Somerford and Lang (1992) used drink-driving offences, alcohol-related traffic accidents and the number of assault charges as indicators of the degree of alcohol-related problems associated with individual licensed premises in the Perth area. Using this information they found that customers of nightclubs, hotels and taverns had a higher probability of being involved in incidents of alcohol-related

harm than customers of clubs and restaurants. Moreover, licensed hotels and taverns classified as high 'risk' (i.e. licensed premises with a higher number of customers involved in road traffic accidents and drink-driving offences) were found to have three times more customers with blood alcohol readings in excess of 0.15 mg/ml exiting their premises, than hotels and taverns classified as low 'risk' (Stockwell, Rydon, Gianatti, Jenkins, Ovenden & Syed 1992). Further research conducted by Stockwell, Lang and Rydon (1993), which used survey data from adult drinkers, found that even when demographic characteristics, such as age, gender and marital status, are controlled for, certain types of drinking settings are significantly associated with alcohol-related harm. In particular, licensed premises that continued to serve obviously intoxicated persons were the settings where drinkers were most likely to experience harm. Licensed premises that are classified as nightclubs or hotels, that offered discounted drinks and permitted overcrowding, also contributed to this increase in risk.

Interestingly, evidence also suggests that some alcoholic beverages are more closely associated with alcohol-related assaults than others. Stockwell, Masters, Philips, Daly, Gahegan, Midford and Philp (1998) examined both police records of night-time assaults (all assaults occurring between 10.00 pm and 6.00 am) and acute alcohol-related morbidity cases (alcohol-related conditions resulting from a 'bout' of intoxication e.g. road injury, falls, drowning) from hospital data as indicators of alcohol-related harm across 130 different areas in Western Australia. Using this information Stockwell and colleagues demonstrated that although population consumption levels of all alcoholic beverage varieties, excluding bottled wine, were significantly associated with rates of acute alcohol-related morbidity, only per capita rates of consumption of cask wine and high-strength beer were significantly associated with night-time assaults. In fact, consumption levels of low-alcohol beer were found to be negatively associated with night-time assault rates.

RESEARCH FROM THE NSW BUREAU OF CRIME STATISTICS AND RESEARCH

Two further studies investigating the association between alcohol, licensed premises and violent crime were conducted by the NSW Bureau of Crime Statistics and Research. In the first study, Stevenson (1996; Stevenson, Lind & Weatherburn 1999) examined the relationship between three types of violent crime (assault, malicious damage to property and offensive behaviour) and the consumption patterns of alcohol across postcodes in NSW. One of the important findings from this study was that the offences of assault, malicious damage to property and offensive behaviour were found to be more common in postcodes that had a higher alcohol sales volume. Furthermore, all four alcohol types investigated (beer, low-alcohol beer, wine and spirits) were found to be equally good predictors of crime rates. This relationship was evident even when differences between postcodes, in terms of age, gender and socio-economic status, were taken into account. When considering where the alcohol was bought and the type of liquor sold, Stevenson found that 'beer sales' was the only variable related to alcohol consumption that uniquely predicted assault rates across postcodes. Furthermore, assaults were more common in postcodes where hotels sold a greater volume of beer than other liquor types. This research also indicated that there was a significant positive correlation between alcohol sales through off-licences and both malicious damage to property and offensive behaviour incidents.

As part of this study, Stevenson developed a model to calculate the impact of reducing alcohol consumption in NSW on crime, in terms of the percentage reduction in particular crime types. From this model, Stevenson estimated that, if the 50 postcodes which sold the highest volume of alcohol in NSW reduced their sales to the statewide mean, this would translate into 324 fewer offensive behaviour incidents, 1,744 fewer malicious damage incidents and 635 fewer assault incidents. He also noted that the model would underestimate the impact that this

reduction in alcohol sales would have on crime rates since it fails to take into account the hundreds of such offences that are never reported to police.

While Stevenson's study found evidence of a significant correlation between alcohol sales volume and violent crime across NSW postcodes, one limitation is that it does not provide information about specific problem locations. However, subsequent research conducted by Jochelson (1997) which analysed the spatial and temporal patterns of assault incidents in inner Sydney was able to identify several major 'hot spots' for assault. A characteristic found to be common to four of these 'hot spots' was that they included busy commercial streets, where numerous entertainment and licensed premises were located. Of further interest is the finding that almost 50 per cent of all assault incidents occurred outdoors, mainly on streets and pavements, and that licensed premises accounted for up to one-third of all assault incidents in some areas. Furthermore, the peak periods for assault incidents were in the early hours of the morning (i.e. between midnight and 3.00 am) and on weekends. The number of assaults during these peak time periods were substantially greater compared with other times. In addition to the recorded crime data, Jochelson also conducted an analysis of victim survey data and found that alcohol was a major theme in the reports of assault victims. Forty-two per cent of respondents indicated that the assault had taken place just outside or inside licensed premises and 40 per cent of victims had consumed alcohol in the two hours preceding the attack, with 22 per cent consuming four or more drinks during this time period.

POLICE RECORDED ALCOHOL-RELATED CRIME IN NSW

The results from studies, such as those reviewed above, provide some impressive evidence for an association between alcohol, licensed premises and violent crime. To further explore this relationship and attempt to gauge the extent to which alcohol-related crime occurs in NSW, an analysis of police

records of alcohol-related crime was undertaken. Although police recorded crime is frequently used to measure various characteristics of criminal behaviour, several methodological issues arise when using this data source to estimate the incidence of alcohol-related crime. These include the inconsistent flagging of incidents related to alcohol recorded in the NSW police database across Local Government Areas, offence type and premises type. In light of this fact, the present analysis also aimed to identify and address such issues and in doing so, lay a foundation for future research in this area.

The following information was extracted from the NSW Police Service's Computerised Operational Policing System (COPS)¹ and describes patterns in assault, offensive behaviour and malicious damage to property offences for the period of July 1999 through June 2000.² While it is recognised that alcohol has been linked to several other types of violent offences, such as homicide and sexual assaults, the three offence types included in this analysis have a relatively high frequency of occurrence and have been repeatedly shown to be associated with alcohol use (for a review see Stevenson 1996).

Trends arising from this data should be considered with the caveat that the alcohol-associated code assigned by police may be subject to variation in recording practice. Even for the most proficient observers, at times it may be difficult to judge whether or not the offenders had in fact been drinking prior to the incident. Similarly, it would be difficult to assess the degree of intoxication or the amount of alcohol consumed by the people involved and thus, it may be unclear as to whether the incident should be coded as alcohol-related. Also, particular types of crimes may not be reported until some time after the event has occurred, making it difficult to assess the amount of alcohol involved in the reported incident. Thus, the information from COPS may underestimate the actual number of alcohol-related incidents that occurred during the 12-month period. Consequently, in addition to the number of incidents that received an alcohol-associated code, the total number of each offence type are also reported here.

Table 1: Number and rates of assault, offensive behaviour and malicious damage to property incidents, NSW, July 1999-June 2000

<i>Offence type</i>	<i>Total incidents</i>	<i>Rate per 100,000 population</i>	<i>Alcohol-related flag</i>	<i>Rate per 100,000 population</i>
Assault	60,142	940	13,910	217
Offensive behaviour	9,591	150	5,531	86
Malicious damage to property	92,841	1,451	5,903	92

Table 1 presents the total number and rate per 100,000 population of assault, offensive behaviour and malicious damage to property incidents. Also shown in Table 1 is the number of incidents of each offence type that were coded by the police as alcohol-related.³ For assault, 60,142 incidents were recorded in NSW, with 13,910 (23%) incidents being assigned an alcohol-associated code. Fifty-eight per cent of a total 9,591 offensive behaviour incidents were recorded as alcohol-related, but only 6 per cent of a total 92,841 malicious damage to property incidents were assigned an alcohol-associated code. This latter finding is not surprising since incidents of malicious damage to property would usually be reported some time after the event had occurred.

Table 2: Top 10 NSW LGAs ranked on assault rates (excluding Sydney metropolitan area), July 1999-June 2000

<i>LGA</i>	<i>Population 1999*</i>	<i>No. of assault incidents</i>	<i>Assault rate per 100,000 population</i>	<i>% alcohol-related flag</i>
Central Darling	2,390	271	11,339	62.7
Bourke	3,772	293	7,768	29.7
Brewarrina	2,197	165	7,510	52.7
Walgett	8,282	494	5,965	46.0
Junee	5,883	206	3,502	16.0
Coonamble	4,861	147	3,024	49.7
Moree Plains	15,110	418	2,766	33.7
Guyra	4,275	115	2,690	41.7
Wentworth	7,084	186	2,626	54.3
Lachlan	7,287	164	2,251	47.0

* Regional Population Growth Australia 1998-99, ABS Catalogue No. 3218.0, Australian Bureau of Statistics, Canberra.

WHERE DO ALCOHOL-RELATED ASSAULTS OCCUR IN NSW?

Table 2 lists the top 10 NSW Local Government Areas (LGAs) outside of the Sydney metropolitan region that had the highest number of assault incidents recorded per residential population. Also shown in this table is the percentage of all assault incidents in each LGA that were flagged by police as alcohol-related. From Table 2 it is evident that the Central Darling LGA had the highest number of assaults recorded per residential population, followed by Bourke, Brewarrina, Walgett and Junee. Furthermore, for all 10 LGAs a large percentage of assault incidents were flagged as alcohol-related. However, it remains unclear whether these differences in the percentage of assaults recorded as alcohol-related reflect true variations across LGAs or alternatively, variations in police recording practice. This is an area that warrants further investigation.

Table 3: Top 10 LGAs in Sydney metropolitan area ranked on assault rates, July 1999-June 2000

<i>LGA</i>	<i>Population 1999*</i>	<i>No. of assault incidents</i>	<i>Assault rate per 100,000 population</i>	<i>% alcohol-related flag</i>
Sydney	22,719	1,768	7,782	27.1
South Sydney	85,659	2,288	2,671	22.7
Campbelltown	149,858	2,127	1,419	12.5
Blacktown	254,222	3,477	1,368	14.1
Botany Bay	35,952	453	1,260	11.7
Marrickville	79,685	968	1,215	13.9
Parramatta	145,530	1,607	1,104	15.6
Penrith	172,988	1,857	1,073	19.2
Leichhardt	61,980	592	955	16.6
Wyong	129,007	1,231	954	20.9

* Regional Population Growth Australia 1998-99, ABS Catalogue No. 3218.0, Australian Bureau of Statistics, Canberra.

Included in Table 3 are the top 10 LGAs in the Sydney metropolitan area that had the highest assault rate per residential population. Table 3 also displays the percentage of all assault incidents in each LGA that were assigned an alcohol-associated code by police. Sydney LGA recorded the most assault incidents per residential population in the Sydney metropolitan area, followed by South Sydney, Campbelltown, Blacktown and Botany Bay. In

comparison to the rural LGAs, a relatively smaller percentage of assault incidents recorded in these areas were assigned an alcohol-associated code, with Sydney having the highest percentage of incidents flagged as alcohol-related (27%). Again, part of this trend may simply reflect a reporting bias rather than an accurate account of events and therefore should be considered with caution.

It should be noted that the per capita rate reported in Table 3 was calculated using residential population estimates and fails to take into account the fact that many people visit particular areas because they contain a greater number of hotels, clubs and restaurants (e.g. Sydney and South Sydney LGAs).

Presumably, this would artificially inflate the alcohol-related assault rates for these districts. Thus, future research needs to account for the influx of visitors into these popular areas when attempting to identify 'hot spots' associated with alcohol-related crime. It is also worth noting that the assault rates for several LGAs outside of the Sydney metropolitan area, not included in Table 2, were in fact higher than the assault rates for some of the Sydney metropolitan LGAs reported in Table 3. For this reason, a list of the top 100 LGAs in NSW ranked on assault rates per residential population is included in Appendix A (for Statistical Division assault rates per 100,000 population see Appendix B).

Table 4 shows that the most frequent venue for reported assaults is on residential premises (43%), though less than one-fifth of these were assigned an alcohol-related flag by the police. Over 28 per cent of reported assaults occurred outdoors or in car parks with 22 per cent of these incidents assigned an alcohol-related flag. Licensed premises were the third most frequent venue in which assaults were reported, though these comprised just 9 per cent of all recorded assaults. However, it would be reasonable to assume that a proportion of outdoor assaults may also have originated on licensed premises. While the number of assault incidents assigned an alcohol-related flag by the police was substantially higher for licensed premises compared with other venues (67%), it is of interest that

Table 4: Assault incidents in NSW by premises type, July 1999-June 2000

<i>Premise type</i>	<i>No. of assault incidents</i>	<i>% of assault incidents</i>	<i>% alcohol-related flag</i>
Residential	26,099	43.4	19.6
Outdoors (incl. car parks)	17,363	28.9	22.4
Licensed premises	5,357	8.9	66.7
Commercial	4,075	6.8	10.9
Other	2,319	3.9	15.5
Law enforcement	2,073	3.4	13.2
Education	1,442	2.4	2.4
Public transport (terminals & vehicles)	1,414	2.4	14.4
Total	60,142	100.0	23.1

approximately one-third of these assaults still did not receive such a flag.

Table 4 includes only those incidents of assault that were reported to the police. However, Bryant and Williams (2000) found that 70 per cent of victims who reported being physically abused by an alcohol-affected person in the 12 months preceding the 1998 NDSH had not reported the incident to police. Thus, caution needs to be exercised when interpreting these findings given that the probability of an assault being reported to the police may vary substantially by premises type. Nonetheless, other research has also found that the majority of victims of alcohol-related violence report that the violence had occurred away from home, with more persons being assaulted in pubs and clubs than any other location (Teese & Williams 2000).

Of the 26,099 assault incidents recorded on residential premises, 15,805 (61%) were flagged by the police as being domestic violence related. Only 2,888 (18%) of these domestic violence flagged residential assaults were also flagged as alcohol-related. However, it should be noted that although the COPS system allows officers to enter up to five associated factor fields, only 12 per cent of all assault incidents have more than one associated factor recorded, and even where only one factor has been recorded, 34 per cent of these were just entered as 'no associated factor'. For 58 per cent of the assaults flagged as

'alcohol-related', there is no other associated factor recorded and this is also the case for 78 per cent of assaults flagged as 'domestic violence related'. Interestingly, however, for those domestic violence related assaults where more than one associated factor was recorded, 84 per cent also had an alcohol-related flag recorded. The issue as to whether the joint attribution of domestic violence and alcohol-related associated factors is being under-reported in the COPS system clearly warrants further investigation.

Type of assault

The flagging of assault incidents as alcohol-related also varies considerably by the type of assault. Table 5 shows the number of incidents within each assault type that were assigned an alcohol-related code by police. Incidents that involved an assault on an officer were most likely to be flagged as alcohol-related (47%), and the more serious offences of assault causing grievous bodily harm (34%) and assault occasioning actual bodily harm (31%) were more likely to be coded as alcohol-related than common assaults (19%).

WHEN DOES ALCOHOL-RELATED CRIME OCCUR?

Assault and offensive behaviour

Figure 1 plots the percentage of all assault incidents that were flagged as alcohol-related within the time period in

which the incident was reported to occur. The corresponding plot for offensive behaviour incidents is also presented.⁴

As shown in Figure 1, the percentage of alcohol-flagged assault incidents increase substantially between the hours of 6.00 pm and 3.00 am, peaking between midnight and 3.00 am. The percentage of alcohol-flagged offensive behaviour incidents follows a similar pattern, with an increase in reports between 6.00 pm and 6.00 am and a peak between midnight and 3.00 am.

These peak times for alcohol-related incidents closely correspond with the closing times of hotels and clubs. Furthermore, these findings are consistent with previous research examining alcohol-related crime which have utilised other sources of data (Devery 1992; Ireland & Thommeny 1993; Jochelson 1997; Stockwell et al. 1998).

Figure 2 presents the percentage of assault and offensive behaviour incidents that were coded by police as alcohol-related by the day on which the

incident was reported to have occurred.⁵ Figure 2 illustrates that weekends, when people are most likely to patronise hotels and clubs, are when alcohol-related crime most frequently occurs.

As outlined previously, there are some concerns regarding the reliability of incidents flagged as alcohol-related in the COPS database, which could potentially distort the reporting of these events. However, even when all reported incidents of assault and offensive behaviour are considered (i.e. regardless of their alcohol-related code) the temporal profiles of these offences reveal a pattern that is suggestive of the involvement of alcohol, with offences more likely to occur late at night and at weekends.

Tables 6 and 7 present the total number of assault and offensive behaviour incidents recorded in COPS by the 10 three-hour time periods in which they were most frequently reported to occur.⁶ Table 6 includes the top 10 three-hour time periods for assault incidents and these time periods accounted for 32 per cent of all assaults recorded in COPS during the target period. Table 7 presents the top 10 three-hour time periods for offensive behaviour incidents, which accounted for 44 per cent of all offensive behaviour incidents recorded. Both Tables 6 and 7 show that assaults and offensive behaviour incidents were most frequently reported to occur between midnight and 3.00 am on Saturday and Sunday mornings, and between 9.00 pm and midnight on Friday and Saturday nights. Again, these times closely correspond with hotel and club closing times and the period when people are most likely to be intoxicated.

Malicious damage to property

In comparison to both assault and offensive behaviour incidents, there was more uncertainty with regard to the times and dates when malicious damage to property incidents had actually occurred. Each incident recorded in COPS contains both a time and date estimating when the incident commenced and when the incident finished. For assault and offensive behaviour incidents, the median difference between these estimated start and end dates was zero days. However, for malicious damage to property incidents, the median difference was one day. The reason for

Figure 1: Percentage of incidents flagged as alcohol-related within incident type by time, NSW, July 1999-June 2000

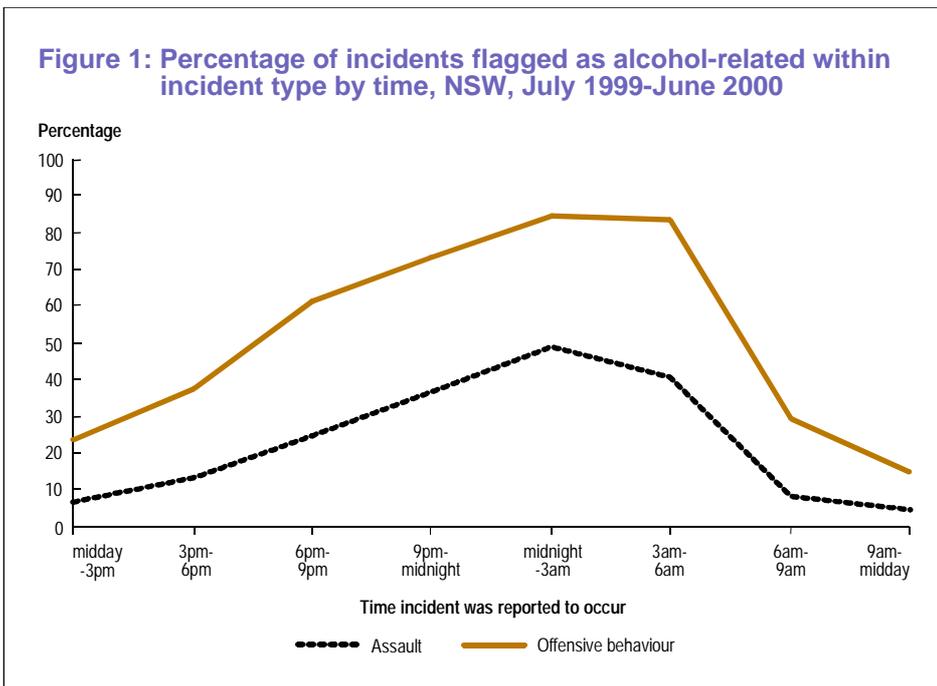
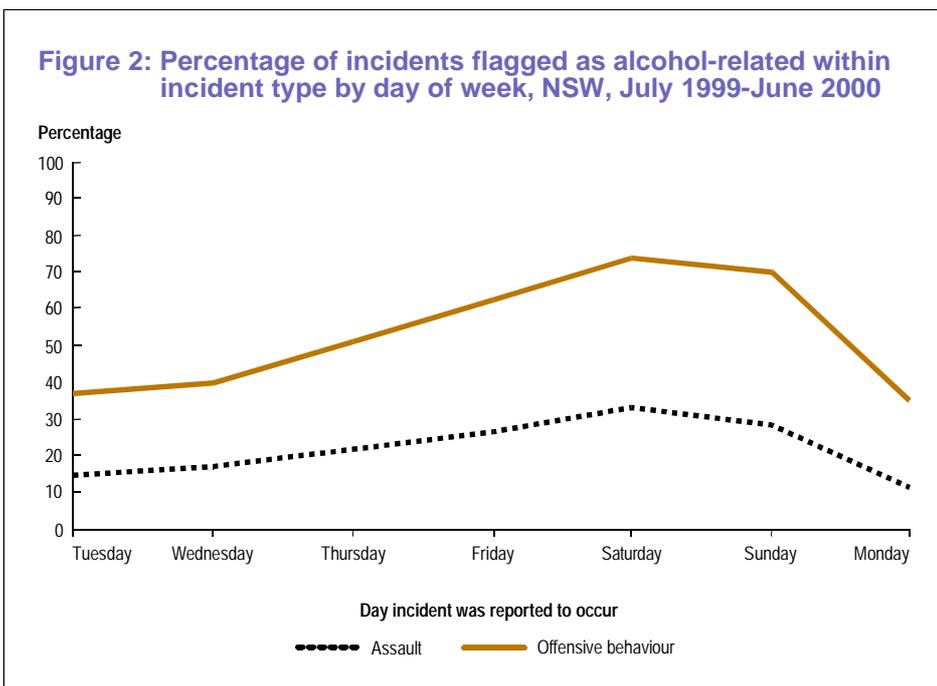


Figure 2: Percentage of incidents flagged as alcohol-related within incident type by day of week, NSW, July 1999-June 2000



this discrepancy is that malicious damage is an offence against property (which may not necessarily be witnessed by a person) rather than an offence against a person (in the case of assaults) or an offence for which there is generally no evidence in the absence of witnesses (in the case of offensive behaviour). Consequently, the start time for the offence of malicious damage would more likely reflect the last time the property was observed to be undamaged rather than the actual time the offence occurred. This would suggest that using the start time recorded in COPS as an estimate of when malicious damage to property offences occurred could potentially be misleading.

Table 8 presents the number of malicious damage incidents and the percentage of incidents flagged as alcohol-related by premises type. As well as residential properties (36%), a large number of malicious damage incidents occur outdoors (23%), on education (20%) and commercial premises (11%). Outdoor, education and commercial premises would be locations where the crime of malicious damage to property may not be discovered and thus reported until some time after the event has occurred. For example, if a school were damaged at a weekend the offence would not be reported until the Monday morning when staff and students return to school. Again, this suggests that the start time recorded in COPS for this type of offence may be unreliable. Furthermore, as mentioned previously, it would be difficult to determine the amount of alcohol involved in the absence of any witnesses. Therefore, despite evidence suggesting that alcohol consumption is associated with the offence of malicious damage to property (Stevenson 1996), very few incidents are flagged by police as alcohol-related.

However, for malicious damage to property incidents which occurred on licensed premises the median difference between the start and end dates was zero days, suggesting that the reported start dates for these offences are likely to be better estimates of when the incident occurred. Also, it would be reasonable to assume that most of these incidents would have, to some extent, involved alcohol. For these reasons, Table 9

Table 5: Type of assault incident by alcohol-related flag, NSW, July 1999-June 2000

<i>Assault type</i>	<i>No. assault incidents</i>	<i>No. alcohol-related flag</i>	<i>% alcohol-related flag</i>
Common assault	43,538	8,325	19.1
Actual bodily harm	12,001	3,674	30.6
Grievous bodily harm	1,776	608	34.2
Assault officer	2,775	1,302	46.9
Shoot with intent other than to murder	52	1	1.9
Total	60,142	13,910	23.1

Table 6: Top 10 three-hour periods (day & time) for assault incidents, NSW, July 1999-June 2000

<i>Day & time</i>	<i>No. assault incidents</i>	<i>% total assault incidents</i>	<i>% alcohol-related flag</i>
Saturday, 12am - 3am	2,831	4.7	55.3
Sunday, 12am - 3am	2,473	4.1	52.6
Friday, 9pm - 12am	2,184	3.6	44.5
Saturday, 9pm - 12am	2,086	3.5	39.1
Friday, 6pm - 9pm	1,788	3.0	27.7
Thursday, 6pm - 9pm	1,711	2.8	26.5
Thursday, 3pm - 6pm	1,672	2.8	15.6
Tuesday, 3pm - 6pm	1,590	2.6	10.8
Saturday, 6pm - 9pm	1,587	2.6	28.6
Friday, 3pm - 6pm	1,567	2.6	13.8

Table 7: Top 10 three-hour periods (day & time) for offensive behaviour incidents, NSW, July 1999-June 2000

<i>Day & time</i>	<i>No. offensive behaviour incidents</i>	<i>% offensive behaviour incidents</i>	<i>% alcohol-related flag</i>
Saturday, 12am - 3am	943	9.8	86.9
Sunday, 12am - 3am	666	6.9	85.6
Friday, 9pm - 12am	589	6.1	76.9
Saturday, 9pm - 12am	432	4.5	75.0
Thursday, 9pm - 12am	285	3.0	74.4
Thursday, 6pm - 9pm	281	2.9	60.9
Friday, 12am - 3am	269	2.8	87.0
Saturday, 3am - 6am	261	2.7	87.4
Thursday, 3pm - 6pm	260	2.7	45.0
Friday, 6pm - 9pm	252	2.6	63.1

Table 8: Malicious damage to property incidents by premises type, NSW, July 1999-June 2000

<i>Premises type</i>	<i>No. malicious damage incidents</i>	<i>% malicious damage incidents</i>	<i>% alcohol-related flag</i>
Residential	33,450	36.0	7.1
Outdoors (incl. car parks)	21,130	22.8	6.4
Licensed premises	1,920	2.1	49.9
Commercial	10,434	11.2	7.2
Other	4,904	5.3	4.8
Law enforcement	592	0.6	18.6
Education	18,525	20.0	0.4
Public transport (terminals & vehicles)	1,886	2.0	1.8
Total	92,841	100.0	6.4

Table 9: Top 10 three-hour periods (day & time) for malicious damage to property incidents, NSW, July 1999-June 2000

<i>Day & time</i>	<i>No. malicious damage incidents on licensed premises</i>	<i>% malicious damage incidents on licensed premises</i>	<i>% alcohol-related flag</i>
Saturday, 12am - 3am	209	10.9	64.1
Sunday, 12am - 3am	149	7.8	65.8
Saturday, 9pm - 12am	143	7.4	55.2
Friday, 9pm - 12am	140	7.3	57.9
Saturday, 6pm - 9pm	85	4.4	44.7
Friday, 12am - 3am	75	3.9	58.7
Thursday, 6pm - 9pm	63	3.3	60.3
Friday, 6pm - 9pm	62	3.2	41.9
Thursday, 9pm - 12am	61	3.2	73.8
Sunday, 9pm - 12am	51	2.7	47.1

includes only the top 10 three-hour time periods for malicious damage to property incidents that occurred on licensed premises.⁷

Similar to all assault and offensive behaviour incidents, malicious damage to property incidents on licensed premises are most likely to occur on Saturday and Sunday mornings between midnight and 3.00 am, and on Friday and Saturday nights between 9.00 pm and midnight. Obviously, these are the times when more people would be frequenting clubs and hotels but it is also of interest that it is late at night or early morning

when people have consumed large amounts of alcohol that this type of offence is more likely to occur.

WHO IS INVOLVED IN CRIMES OF VIOLENCE AND DISORDER?

In addition to any details regarding the victim, incidents recorded in COPS include a person of interest (POI) file that contains any details about the alleged offender that are known. Furthermore, each incident recorded can involve more than one victim and/or more than one offender. The following paragraphs

contain a brief description of the persons involved in assault, offensive behaviour and malicious damage to property incidents as recorded in COPS for the period July 1999 through June 2000.

Assault

A POI was recorded for approximately 80 per cent of all assault incidents reported between July 1999 and June 2000, while a victim was recorded for almost all (99.3%) of the reported assault incidents. Overall, 55 per cent of assault incidents involved only male victims, 41 per cent involved only female victims and 3 per cent were incidents involving both male and female victims. Of those incidents where a POI had been recorded, 81 per cent involved male POIs only, 16 per cent involved female POIs only and 2 per cent involved both male and female POIs. Incidents of assault involving female victims only were more likely to contain a recorded POI (90%) than were those involving males only (73%).

There was, however, considerable variation in the gender profile of POIs when incidents of assaults were broken down by premises type and victim gender, as shown in Table 10. Assaults that occurred either on licensed premises or outdoors were more likely to have no recorded POI (approximately 33%) compared with those assaults occurring on residential premises (9%). Furthermore, assaults involving a male victim were more likely to have no recorded POI than assaults involving female victims.

Males were consistently the largest category of POI across the main combinations of premises type and victim gender; however the magnitude of this gender effect varied substantially. Female victims on residential premises were more likely to have been assaulted by a male POI (84%) compared with female victims either on licensed premises (45%) or outdoors (51%). Interestingly, almost one-third of female victims on licensed premises and one-quarter of female victims assaulted outdoors involved a female POI only.

Table 11 shows the respective mean ages of recorded POIs and victims broken down by premises type, POI and victim gender. Overall, POIs from assaults on residential premises were older than those from assaults on licensed premises, who in turn were

older than those POIs identified in assaults that occurred outdoors. A striking feature of the findings reported in Table 11 is that male POIs identified in assaults on female victims were 2-3 years older on average than were those males whose victims were also male.

Offensive behaviour and malicious damage to property

Similar to assault incidents, the vast majority of POIs identified in offensive behaviour incidents were male (77%), while only 17 per cent were female. Only 2 per cent of offensive behaviour incidents involved both a male and female POI, while 3 per cent did not have a POI recorded. Overall, the mean age of the POI identified in offensive behaviour incidents was 25.6 years (SD=10) and this did not vary by gender of POI. With respect to malicious damage to property, over 78 per cent of these incidents did not have a POI recorded. This latter finding is not surprising considering the nature of the crime and the venues where it typically occurs.

HOW CAN WE REDUCE ALCOHOL-RELATED CRIME?

One issue that arises from the above information is the inconsistent flagging of incidents related to alcohol in the COPS database. This is particularly evident by the fact that approximately one-third of assaults on licensed premises did not receive an alcohol-associated code by police, though it would be reasonable to assume that most of these incidents would, to some extent, have involved alcohol. This problem highlights the need for further research to establish the extent to which police record alcohol-related crime. Validation of COPS records with similar information from other data sources, such as hospital separation records and emergency room data, would increase our understanding of alcohol-related crime and the impact it has on the community. However, with these limitations in mind, the present findings from this data source, which appear to be consistent with previous research, identify several areas that could be targeted to reduce the frequency of alcohol-related crime.

Firstly, the prevention of drinking in certain public places by enforcing existing prohibited drinking laws (e.g.

Table 10: Gender profile of POIs for assault incidents by victim gender and premises type, NSW, July 1999-June 2000

<i>Gender profile of POI</i>	<i>% male POI</i>	<i>% female POI</i>	<i>% male & female POI</i>	<i>% no POI recorded</i>
Licensed premises				
Male victims (n = 4,033)	58	5	1	35
Female victims (n = 1,106)	45	32	1	21
Both male & female victims (n = 144)	41	13	13	33
Residential				
Male victims (n = 9,406)	67	17	2	14
Female victims (n = 15,383)	84	12	1	4
Both male & female victims (n = 1,023)	50	9	23	18
Outdoor/car park				
Male victims (n = 11,728)	56	6	1	37
Female victims (n = 4,992)	51	25	2	22
Both male & female victims (n = 452)	44	10	16	29

Note: The unit of analysis (n) included in this table is the incident. Each incident may involve more than one victim or POI.

Table 11: Assaults - Mean age (years) and standard deviation (SD) of POIs and victims by gender and premises type, NSW, July 1999-June 2000

<i>Gender profile of POI</i>	<i>Mean POI age (SD)</i>	<i>Mean victim age (SD)</i>
Licensed premises		
Male POI, male victim	28.7 (8.9)	31.0 (10.4)
Male POI, female victim	31.8 (9.6)	29.0 (10.0)
Female POI, male victim	28.8 (9.1)	32.0 (9.6)
Female POI, female victim	26.6 (8.5)	28.1 (10.6)
Residential		
Male POI, male victim	30.5 (11.4)	32.1 (15.1)
Male POI, female victim	32.7 (10.5)	31.1 (11.5)
Female POI, male victim	32.4 (10.9)	33.3 (13.5)
Female POI, female victim	28.1 (10.8)	30.6 (14.5)
Outdoor/car park		
Male POI, male victim	26.5 (10.9)	28.6 (12.8)
Male POI, female victim	29.9 (11.0)	28.0 (11.2)
Female POI, male victim	27.5 (10.0)	31.1 (13.0)
Female POI, female victim	23.6 (9.9)	24.0 (11.8)

Note: Incidents involving both male and female POIs or both male and female victims are excluded from this table due to the small numbers involved.

alcohol-free zones) could be a useful strategy to reduce alcohol-related crime. Since many assaults occur outdoors and evidence suggests that alcohol sales through off-licences are associated with both malicious damage to property and offensive behaviour incidents (Stevenson 1996), a reduction in the number of intoxicated persons on the street could have an important impact on these types of crimes. However, it should

be noted that this may simply lead to the displacement of problem drinkers to other areas rather than an actual decrease in alcohol-related incidents. An alternative solution may be to attempt to systematically reduce the levels of alcohol consumption. Several ways this could be achieved include an increase in tax on alcohol, restricting outlet sales hours or restricting the number of outlets (Stevenson 1996).

Secondly, violent crime frequently occurs in conjunction with the closing times of hotels and clubs. Most hotels and clubs close at similar times, causing intoxicated patrons from different licensed premises to congregate in the same area and this could lead to an increase in the propensity for violence. An attempt to prevent gatherings following the closure of hotels and clubs in high-risk areas could reduce the likelihood of conflict and thus reduce the number of violent incidents. This might be achieved by staggering hotels' and clubs' closing times, ensuring better transport is available to move intoxicated patrons out of these areas more efficiently or police monitoring of bottlenecks where several licensed premises are situated.

Finally, limiting the intoxication levels of patrons who drink on licensed premises by enforcing policies promoted by responsible drinking campaigns may serve to reduce violent incidents that are associated with alcohol. This recommendation receives support from the Western Australian research demonstrating that licensed premises where barstaff continue to serve obviously intoxicated customers are the most likely settings for drinkers to experience alcohol-related harm (Stockwell et al. 1993). However, the key to the success of responsible service legislation is consistent and effective enforcement. At present, in NSW, it is difficult to gauge the extent to which these laws are being enforced, since a comprehensive analysis documenting what percentage of breaches recorded by police are prosecuted in the Licensing Court/Local Courts, as well as the outcomes of such prosecutions, has yet to be reported. Nevertheless, Western Australian and European research has shown that such legislation is frequently ignored by retailers of alcoholic beverages (Andréasson, Lindewald & Rehnman 2000; Rydon, Stockwell, Lang & Beel 1996). The existence of legislation prohibiting the sale of alcohol to intoxicated people does not, in itself, lead to a sustained improvement in serving practices. It is only through regular monitoring and consistent sanctions that such laws will be adhered to and thus prove effective in reducing the number of alcohol-related violent incidents in NSW.

FUTURE RESEARCH

Although this bulletin provides initial evidence of a relationship between alcohol, licensed premises and violent crime in NSW, further research that more thoroughly evaluates the nature and extent of this relationship is warranted. Thus, a collaborative research project has been established between the NSW Bureau of Crime Statistics and Research, Curtin University's National Drug Research Institute and the Drug Programs Bureau of the NSW Health Department to further investigate alcohol-related crime in NSW. The project team will liaise closely with the NSW Police Service with a view to producing research findings that have operational as well as academic relevance. A major component of the project involves an epidemiological analysis of the information reported on the COPS database with respect to alcohol-related crime. Other possible areas of research to be pursued include conducting local-area based analyses to better identify 'hotspots' for alcohol-related crime, and examining the relationship between recorded crime and health outcomes data, such as hospital separations and emergency room incidents, at the local area level. Given the questionable reliability of police assigned alcohol-related flags for incidents of crime, our Project colleagues at the National Drug Research Institute in collaboration with researchers at Turning Point have been further investigating the use of night-time assault rates as a proxy indicator of alcohol-related harm on a national basis. The findings from this research endeavour, for all Australian States and Territories, will be published in a National Alcohol Indicators Project (NAIP) Bulletin later this year.

Another important area of research is the investigation of the association between the number of proceedings for breach of the Liquor Act (1982) and the areas associated with high rates of alcohol-related crime. This would include proceedings against individuals and establishments brought before both the Local Courts and the Licensing Court, as well as data on the number of infringement notices issued by police. Using this information, it would be useful to examine whether the areas that have high alcohol-related crime rates are also the areas that have high breach rates. If this is not the case, and postcodes that

have a high alcohol-related crime rate also have low breach rates, then these areas should be targeted to ensure that the licensed premises are serving alcohol in a legally responsible way.

SUMMARY

- In the 12 months preceding June 2000, NSW police flagged 13,910 (23%) assault incidents, 5,531 offensive behaviour incidents (58%) and 5,903 malicious damage to property incidents (6%) as alcohol-related.
- Central Darling LGA had the highest assault rate in NSW and Sydney LGA had the highest assault rate in the metropolitan area, though this latter rate probably reflects the large transient population who frequent the Central Business District. A smaller percentage of assault incidents were flagged as alcohol-related in Sydney metropolitan LGAs than in rural NSW LGAs.
- The most frequent venue for reported assaults in NSW is on residential premises (43%), followed by outdoors (29%) and licensed premises (9%). One-third of assaults on licensed premises did not receive an alcohol-related flag.
- Assault and offensive behaviour incidents were found to occur most frequently on Friday and Saturday nights between the hours of 9.00 pm and 3.00 am. Malicious damage to property incidents on licensed premises were also more likely to occur at these times.
- The vast majority of alleged offenders involved in assault incidents were male (81%) and victims of assaults were also more likely to be male (55%). Female victims on residential premises were more likely to have been assaulted by a male (84%) compared with female victims either on licensed premises (45%) or outdoors (51%). Males identified in assaults on female victims were 2-3 years older than males whose victims were also male.
- The mean age of all persons identified in offensive behaviour incidents was 25.6 years and males were more often identified as perpetrators of this offence (77%). Seventy-eight per cent of malicious damage to property incidents did not have a person of interest recorded.
- Overall, incidents related to alcohol appear to be inconsistently flagged in the NSW COPS database and future research needs to verify the information obtained from this data source with evidence from other records.

ACKNOWLEDGEMENTS

The authors would like to thank Dr Don Weatherburn, Ms Bronwyn Lind, Dr Christine Coumarelos, Ms Karen Freeman, of the NSW Bureau of Crime Statistics and Research, Prof Tim Stockwell, Ms Tanya Chikritzhs, of the National Drug Research Institute, Curtin University, and Dr Peter McCarthy, of the Drug Programs Bureau, NSW Health, for their comments on earlier drafts of this bulletin. We are also grateful to other Bureau staff for their contribution to this publication, including Mr Mark Ramsay who was responsible for coordinating the data extraction and Mr Jonathan Nichol who was responsible for desktop publishing.

NOTES

1. Incident file initially extracted 15 August 2000 and updated 12 February 2001.
2. This time period is based upon the date that each incident was reported to the police. Of the 162,574 incidents of assault, offensive behaviour and malicious damage to property, 161,291 (99.2%) were also recorded as having actually occurred during the period July 1999 through June 2000. The incident start dates recorded as having occurred outside the reporting period are likely to reflect a combination of both delayed reporting of some incidents to police by victims and/or witnesses, as well as administrative errors in the entry of the start dates. The only way to verify this, would be to audit police narratives of all of these, a time consuming process which would delay the dissemination of these findings. Given the very small percentage of incidents recorded as having occurred outside the reporting period (0.8 per cent) and the very large denominators involved, the degree of bias likely to have been introduced to the prevalence estimates through administrative error would be negligible. Therefore all incidents extracted over this reporting period are utilised in this analysis.
3. In this bulletin, incidents rather than events are adopted as the unit of analysis given that they represent the most basic reporting unit on the COPS system. However, it is possible for two or more separately recorded incidents to be defined as belonging to the same criminal event. According to the COPS data dictionary '*an event requires police to initiate a chain of actions which must be seen through to an accountable outcome*'. Defining the data in terms of the number of events, there were 54,089 events comprising at least one assault incident, 89,520 events comprising

at least one malicious damage to property incident and 9,000 events comprising at least one offensive behaviour incident.

4. Based on recorded incident start time.
5. Based on recorded incident start date.
6. Based on recorded incident start time and date.
7. Based on recorded incident start time and date.

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APPENDIX A: Top 100 NSW LGAs ranked on assault rates, July 1999-June 2000

<i>Rank</i>	<i>LGA#</i>	<i>Population 1999*</i>	<i>No. of assault incidents</i>	<i>Assault rate per 100,000 population</i>	<i>% alcohol- related flag</i>
1	Central Darling	2,390	271	11,339	62.7
2	Sydney	22,719	1,768	7,782	27.1
3	Bourke	3,772	293	7,768	29.7
4	Brewarrina	2,197	165	7,510	52.7
5	Walgett	8,282	494	5,965	46.0
6	Junee	5,883	206	3,502	16.0
7	Coonamble	4,861	147	3,024	49.7
8	Moree Plains	15,110	418	2,766	33.7
9	Guyra	4,275	115	2,690	41.7
10	South Sydney	85,659	2,288	2,671	22.7
11	Wentworth	7,084	186	2,626	54.3
12	Lachlan	7,287	164	2,251	47.0
13	Leeton	11,504	221	1,921	37.1
14	Narrabri	13,910	256	1,840	44.5
15	Broken Hill	20,934	363	1,734	39.1
16	Inverell	14,915	257	1,723	37.7
17	Narrandera	6,844	113	1,651	46.0
18	Kempsey	27,010	443	1,640	31.2
19	Gilgandra	4,735	76	1,605	31.6
20	Murrumbidgee	2,636	42	1,593	52.4
21	Goulburn	20,792	326	1,568	28.2
22	Cobar	5,574	87	1,561	46.0
23	Dubbo	37,396	577	1,543	21.0
24	Nundle	1,367	21	1,536	23.8
25	Forbes	10,136	155	1,529	48.4
26	Casino	10,596	162	1,529	30.2
27	Richmond River	10,077	153	1,518	39.2
28	Maclean	16,364	248	1,516	31.0
29	Bogan	3,244	49	1,510	34.7
30	Evans	5,250	78	1,486	23.1
31	Campbelltown	149,858	2,127	1,419	12.5
32	Narromine	6,583	93	1,413	25.8
33	Queanbeyan	29,325	409	1,395	30.8
34	Parkes	15,141	209	1,380	34.9
35	Cowra	12,555	172	1,370	34.9
36	Blacktown	254,222	3,477	1,368	14.1
37	Wagga Wagga	56,172	754	1,342	30.6
38	Mulwaree	6,192	83	1,340	18.1
39	Orange	35,913	479	1,334	29.4
40	Coffs Harbour	59,068	795	1,334	36.5
41	Lismore	43,199	576	1,333	27.3
42	Rylstone	3,715	49	1,319	36.7
43	Tumbarumba	3,664	48	1,310	58.3
44	Tumut	11,086	144	1,299	37.5
45	Kyogle	9,788	127	1,298	50.4
46	Young	11,387	146	1,282	30.8
47	Eurobodalla	31,465	403	1,281	37.2
48	Bathurst	29,983	379	1,264	30.1
49	Botany Bay	35,952	453	1,260	11.7
50	Severn	2,918	36	1,234	22.2

Any LGA with a population less than 1,000 persons was excluded from this table due to the relatively small number of total assaults.

* Regional Population Growth Australia 1998-99, ABS Catalogue No. 3218.0, Australian Bureau of Statistics, Canberra.

APPENDIX A: Top 100 NSW LGAs ranked on assault rates, July 1999-June 2000, continued

<i>Rank</i>	<i>LGA#</i>	<i>Population 1999*</i>	<i>No. of assault incidents</i>	<i>Assault rate per 100,000 population</i>	<i>% alcohol- related flag</i>
51	Muswellbrook	15,271	186	1,218	31.7
52	Marrickville	79,685	968	1,215	13.9
53	Greater Taree	44,046	535	1,215	29.7
54	Newcastle	139,701	1,693	1,212	23.3
55	Barraba	2,249	27	1,201	29.6
56	Tenterfield	6,609	79	1,195	45.6
57	Nambucca	17,662	211	1,195	31.8
58	Snowy River	6,424	76	1,183	36.8
59	Cootamundra	7,446	88	1,182	22.7
60	Murray	5,818	68	1,169	35.3
61	Albury	42,369	494	1,166	32.2
62	Coonabarabran	6,762	78	1,154	55.1
63	Shoalhaven	82,330	934	1,134	31.5
64	Armidale	20,985	236	1,125	33.9
65	Griffith	23,238	260	1,119	43.5
66	Nymbodia	4,481	50	1,116	34.0
67	Dumaresq	3,768	42	1,115	23.8
68	Deniliquin	8,189	91	1,111	42.9
69	Parramatta	145,530	1,607	1,104	15.6
70	Greater Lithgow	19,867	218	1,097	25.7
71	Uralla	5,744	63	1,097	36.5
72	Walcha	3,228	35	1,084	82.9
73	Byron	28,506	309	1,084	26.2
74	Penrith	172,988	1,857	1,073	19.2
75	Wollongong	186,172	1,981	1,064	20.8
76	Balranald	2,931	31	1,058	54.8
77	Cessnock	46,597	489	1,049	22.3
78	Ulmarra	6,210	65	1,047	30.8
79	Grafton	17,012	175	1,029	33.1
80	Yass	9,390	94	1,001	40.4
81	Maitland	53,476	524	980	28.8
82	Great Lakes	30,494	297	974	30.3
83	Bega Valley	28,971	281	970	35.2
84	Conargo	1,445	14	969	57.1
85	Leichhardt	61,980	592	955	16.6
86	Wyong	129,007	1,231	954	20.9
87	Bingara	1,996	19	952	73.7
88	Yarrowlumla	9,573	91	951	35.2
89	Tamworth	35,796	333	930	26.4
90	Manly	38,227	353	923	34.3
91	Mudgee	18,031	162	898	34.6
92	Ballina	36,656	326	889	34.0
93	Port Stephens	55,840	495	886	31.3
94	Glen Innes	5,941	52	875	30.8
95	Auburn	58,038	507	874	10.8
96	Copmanhurst	4,156	36	866	38.9
97	Harden	3,765	32	850	40.6
98	Strathfield	28,528	241	845	15.8
99	Liverpool	142,947	1,204	842	8.6
100	Randwick	126,369	1,062	840	23.3

Any LGA with a population less than 1,000 persons was excluded from this table due to the relatively small number of total assaults.

* Regional Population Growth Australia 1998-99, ABS Catalogue No. 3218.0, Australian Bureau of Statistics, Canberra.

APPENDIX B:**Assault rates by Statistical Division and Statistical Subdivision, NSW, July 1999-June 2000**

<i>Statistical Division</i>	<i>Population 1999*</i>	<i>No. of assault incidents</i>	<i>Assault rate per 100,000 population</i>	<i>% alcohol- related flag</i>
Sydney	4,031,944	33,290	826	17.0
Inner Sydney	285,923	6,069	2,123	21.2
Eastern Suburbs	245,671	1,850	753	22.4
St George - Sutherland	424,455	2,126	501	18.3
Canterbury - Bankstown	307,644	1,887	613	7.3
Fairfield - Liverpool	333,209	2,783	835	9.8
Outer South Western Sydney	225,812	2,570	1,138	13.3
Inner Western Sydney	160,303	1,072	669	13.7
Central Western Sydney	289,923	2,802	966	13.4
Outer Western Sydney	311,046	2,659	855	20.1
Blacktown - Baulkham Hills	387,589	3,918	1,011	14.3
Lower Northern Sydney	289,584	1,292	446	17.1
Hornsby - Ku-ring-gai	256,278	621	242	17.6
Northern Beaches	227,697	1,150	505	24.3
Gosford-Wyong	286,810	2,491	869	23.4
Hunter	571,465	5,088	890	23.8
Illawarra	384,588	3,751	975	23.6
Richmond - Tweed	208,791	2,122	1,016	29.9
Mid-North Coast	270,697	3,150	1,164	31.6
Northern	174,546	2,198	1,259	35.1
North Western	117,251	2,308	1,968	36.0
Central West	172,963	2,134	1,234	33.4
South Eastern	181,182	2,091	1,154	32.6
Murrumbidgee	148,621	1,988	1,338	34.6
Murray	110,467	1,151	1,042	40.2
Far West	24,188	653	2,700	49.2

Note: SD or SSD unable to be assigned for 218 incidents.

* Regional Population Growth Australia 1998-99, ABS Catalogue No. 3218.0, Australian Bureau of Statistics, Canberra.

RECENT NDRI TECHNICAL REPORTS

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